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Abstract

Forty-eight mixed-breed steers from two sources were used in a 141-day feedlot study to compare a control ration (C) with a ration containing magnesium-mica (MM; 9 lb/ton). No diet cattle source interactions were detected. Steer gain, efficiency, and cost of gain did not differ (P>.10) between diets. Marbling score tended (P<.10) to be greater and the percentage of cattle grading USDA Choice and net carcass value were greater (P<.05) for steers fed MM. Feeding MM in a feedlot ration may have a substantial economic impact on feedlot cattle.

Keywords

Cattlemen's Day, 1996; Kansas Agricultural Experiment Station contribution; no. 96-334-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 756; Beef; Magnesium-Mica; Feedlot cattle; Marbling score

PERFORMANCE OF FINISHING STEERS OFFERED MAGNESIUM-MICA IN THE FEEDLOT RATION [1]

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Summary

Forty-eight mixed-breed steers from two sources were used in a 141-day feedlot study to compare a control ration (C) with a ration containing magnesium-mica (MM; 9 lb/ton). No diet cattle source interactions were detected. Steer gain, efficiency, and cost of gain did not differ (P>.10) between diets. Marbling score tended (P<.10) to be greater and the percentage of cattle grading USDA Choice and net carcass value were greater (P<.05) for steers fed MM. Feeding MM in a feedlot ration may have a substantial economic impact on feedlot cattle.

(Key Words: Magnesium-Mica, Feedlot Cattle, Marbling Score.)

Introduction

Magnesium-mica (MM) is a mined product that is used as a pellet-binding and feed-diluting agent. Previous work at KSU-SEARC has shown a tendency for increased digestibility and increased rumen fermentation products from cattle fed MM. Our objective was to measure the effect of MM on performance and carcass characteristics of feedlot cattle.

Experimental Procedures

Twenty-four mixed-breed steers previously grazing tall fescue pastures and 24 Angus Simmental crossbred steers previously grazing smooth bromegrass were allotted within cattle source into eight groups of six head each on January 20, 1994. The groups then were allotted randomly to receive one of two finishing diets consisting of 80% ground grain sorghum, 15% corn silage, and 5% protein supplement (50% CP) on a dry matter basis (Table 1). Cattle received the finishing diet for 141 days and then were slaughtered at a commercial packing plant. Carcass data were collected following a 24-hour chill.

Results and Discussion

No diet by cattle source interaction was detected in the study. Therefore, data are expressed within main effects. Steers receiving MM were somewhat heavier at the initiation of the study than were C steers (Table 2). Final weight and gain, feed cost, feed efficiency, and feed cost per cwt of gain did not differ (P>.10) between diets. However, total feed cost was numerically $16.47 lower per steer and cost of gain was numerically

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$3.00 less per cwt of gain for steers fed MM than for steers fed C.

Hot carcass weight, dressing percentage, fat thickness, and USDA Yield Grades did not differ (P>.10) between diets (Table 3). Marbling scores averaged over one third of a quality grade higher (P<.10) for steers fed MM. Steers in this study graded poorly. Therefore, this increase in marbling score from steers fed MM resulted in a substantial increase (P<.05) in the percentage of steers grading USDA Choice, which further resulted in a $50.92 higher (P<.05) carcass value.

Magnesium-mica had no effect on feedlot gain, consumption, efficiency, carcass weight, or fat thickness but had a substantial effect on carcass marbling. Although this study utilized a limited number of animals (48) and marbling score is highly variable, the fact that 13 of 24 steers fed MM graded Choice (versus only 3 of 24 control steers) certainly casts doubt that the differences were due to chance. Although a biological explanation for the improved marbling score by steers fed MM is not clear, this improvement potentially represents a significant economic benefit.

Table 1. Compositions of Diets Offered to Finishing Steers

Ingredient	Control	Magnesium-Mica
Ground grain sorghum	80.0	80.0
Corn silage	15.0	15.0
Soybean meal	2.5	2.6
Wheat middlings	.81	.25
Ground limestone	.50	.50
Urea	.43	.45
TM salt	.25	.25
Cane molasses	.15	.15
Dicalcium phosphate	.13	.13
Potassium chloride	.13	.13
Vitamin A,D,E premix	.10	.10
Rumensin premix	.0125	.0125
Magnesium-mica	-	.45

Table 2. Performance by Finishing S teers Offered Magnesium-Mica (9 lb/ton) in the Feedlot Ration

	Diet		Cattle Source [a]	
Item	Control	Magnesium Mica	Purchased	SEARC
Initial wt., lb [b]	862	879	811	930
Final wt., lb [b]	1340	1354	1248	1446
Gain, lb [c]	478	475	437	516
Daily gain, lb [c]	3.4	3.4	3.1	3.7
Daily DM intake, lb [b]	29.0	28.3	26.4	30.9
Gain/feed, lb/lb	.117	.119	.118	.119
Feed cost, $ [c]	257.25	240.78	226.20	271.83
Feed cost, $/cwt gain	53.98	50.98	51.78	53.18

[a]Purchased steers were exotic mixed-breed steers. SEARC steers were Angus Simmental and Simmental Angus crossbred steers.
[b]Differences between cattle sources were detected (P<.05).
[c]Differences between cattle sources were detected (P<.10).

Table 3. Carcass Characteristics of Finishing Steers Offered Magnesium-Mic a (9 lb/ton) in the Feedlot Ration

	Diet		Cattle Source [a]	
Characteristic	Control	Magnesium Mica	Purchased	SEARC
Hot carcass wt, lb [b]	804	814	747	871
Dressing % [c]	60.0	60.0	59.8	60.3
Fat thickness, in	.30	.28	.28	.30
Longissimus eye area, in [2]	13.8	13.8	13.6	14.1
Marbling score [def]	386	499	387	498
% USDA Choice [bg]	12.5	54.2	20.8	45.8
USDA Yield Grade [b]	1.4	1.6	1.2	1.8
Net carcass value, $ [bg]	786.80	837.72	750.56	873.95

[a]Purchased steers were exotic mixed-breed steers. SEARC steers were Angus Simmental and Simmental Angus crossbred steers.
[b]Differences between cattle sources were detected (P<.05).
[c]Calculated using actual unshrunk live weight.
[d]300 = Select^{-}; 400 = Select^{0}; 500 = Select^{+}.
[e]Differences between diets were detected (P<.10).
[f]Differences between cattle sources were detected (P<.10).
[g]Differences between diets were detected (P<.05).